

## REMARKS/ARGUMENTS

In the Final Office Action mailed February 4, 2009, claims 1-11 are rejected. In response, Applicants propose amending claims 1-11 and adding new claims 12-18. Applicants respectfully request that the amendments be entered to put the claims in condition for allowance or to put the claims in better condition for appeal. Applicants hereby request reconsideration of the application in view of the proposed amendments and the below-provided remarks.

### Claim Rejections under 35 U.S.C. 103

Claims 1, 3, 5-7, 10, and 11 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kemmochi et al. (U.S. Pat. Pub. No. 2004/0032706 A1, hereafter “Kemmochi”) in view of Sugar et al. (U.S. Pat. No. 6,728,517, hereafter “Sugar”). Claim 2 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kemmochi in view of Sugar and further in view of Ella et al. (U.S. Pat. No. 6,751,470, hereafter “Ella”). Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kemmochi in view of Sugar and further in view of Hikita et al. (U.S. Pat. No. 6,525,624, hereafter “Hikita”). Applicants respectfully submit that the pending claims are patentable over the cited references for the reasons provided below.

### Independent Claim 1

Applicants propose amending claim 1 to add the phrase “wherein the phase shifting circuit has an input terminal and an output terminal, the input terminal of the phase shifting circuit being coupled to the terminal.” Applicants also propose amending claim 1 to replace the phrase “a band pass filter (RXF2,RXF3) coupled to the phase shifting circuit” with the phrase “a band pass filter coupled to the output terminal of the phase shifting circuit” and to replace the phrase “each of the phase shifting circuits (PS1,PS2) is impedance transforming from a lower impedance to a higher impedance” with the phrase “the phase shifting circuit has input impedance and output impedance, the input impedance being smaller than the output impedance, the input impedance being applied to the terminal through the input terminal of the phase shifting circuit, the output impedance being applied to the band pass filter through the output terminal of the phase

shifting circuit.” Additionally, Applicants propose amending claim 1 to correct informalities and to remove reference numbers. Support for the proposed amendments to claim 1 can be found in Applicants’ specification at, for example, Fig. 2 and page 6, lines 26-30.

Applicants respectfully assert that Kemmochi fails to teach that “*the phase shifting circuit has input impedance and output impedance, the input impedance being smaller than the output impedance, the input impedance being applied to the terminal through the input terminal of the phase shifting circuit, the output impedance being applied to the band pass filter through the output terminal of the phase shifting circuit,*” as recited in amended claim 1.

The Final Office Action states that Kemmochi fails to teach the previously presented limitation, “each of the phase shifting circuits (PS1,PS2) is impedance transforming from a lower impedance to a higher impedance,” see the last line of page 3 and the first two lines of page 4 of the Final Office Action. Because the currently amended limitation of claim 1 is similar to the previously presented limitation, Applicants respectfully assert that Kemmochi likewise fails to teach the currently amended limitation of claim 1.

Applicants respectfully assert that Sugar also fails to teach the above-identified limitation of amended claim 1. In particular, Sugar fails to teach “*the input impedance being smaller than the output impedance, the input impedance being applied to the terminal through the input terminal of the phase shifting circuit, the output impedance being applied to the band pass filter through the output terminal of the phase shifting circuit*” (emphasis added), as recited in amended claim 1.

With reference to the radio front-end section shown in Fig. 8, Sugar teaches that a quarter-wave element (515) creates a phase shift that acts as an impedance transformer, either shorting the connection between a band pass filter ((122) or (120)) and ground, or creating an open circuit, depending on the position of a transmit/receive “T/R” switch ((112) or (110)), see also column 13, lines 2-7. Because the radio front-end section shown in Fig. 8 of Sugar is symmetrical, the following remarks, which are directed to the quarter-wave element (515), the band pass filter (122), and the “T/R” switch (112) on the right side of the radio front-end section, also apply to the quarter-wave element (515), the

band pass filter (120), and the “T/R” switch (110) on the left side of the radio front-end section.

Sugar teaches that the quarter-wave element (515) is between the band pass filter (122) and one of the two terminals of the “T/R” switch (112), see Fig. 8 and column 12, lines 58-66. That is, Sugar teaches that the quarter-wave element (515) has one impedance, which is applied to a terminal of the “T/R” switch (112), and another impedance, which is applied to the band pass filter (122). However, Sugar fails to teach that the impedance of the quarter-wave element (515), which is applied to one terminal of the “T/R” switch (112), is smaller than the impedance of the quarter-wave element (515), which is applied to the band pass filter (122). Because Sugar fails to teach that the impedance of the quarter-wave element (515), which is applied to one terminal of the “T/R” switch (112), is smaller than the impedance of the quarter-wave element (515), which is applied to the band pass filter (122), Sugar fails to teach *“the input impedance being smaller than the output impedance, the input impedance being applied to the terminal through the input terminal of the phase shifting circuit, the output impedance being applied to the band pass filter through the output terminal of the phase shifting circuit”* (emphasis added), as recited in amended claim 1.

Accordingly, Applicants respectfully assert that Kemmochi in view of Sugar fails to teach all of the limitations of claim 1. Thus, Applicants respectfully assert that claim 1 is patentable over Kemmochi in view of Sugar.

#### Dependent Claims 2-7

Applicants propose amending claims 2-7 to remove reference numbers and amending claim 4 to correct an informality. Additionally, Applicants propose amending claim 2 to replace the term “BAW” with the phrase “Bulk Acoustic Wave” and amending claim 3 to replace the term “SAW” with the phrase “Surface Acoustic Wave.” Support for the proposed amendments to claims 2 and 3 can be found in Applicants’ specification at, for example, original claims 1-3 and page 4, lines 15-18. Claims 2-7 depend from and incorporate all of the limitations of the independent claim 1. Thus, Applicants respectfully assert that claims 2-7 are allowable at least based on an allowable claim 1.

#### Independent Claim 8

Applicants propose amending claim 8 in a similar fashion as claim 1. Support for the proposed amendments to claim 8 can be found in Applicants' specification at, for example, Fig. 2 and page 6, lines 26-30. Claim 8 includes similar limitations to claim 1. Because of the similarities between claim 1 and claim 8, Applicants respectfully assert that the remarks provided above with regard to claim 1 apply also to claim 8. Accordingly, Applicants respectfully assert that claim 8 is patentable over Kemmochi in view of Sugar. Additionally, claim 8 may be allowable for further reasons, as described below.

The Final Office Action states that Kemmochi teaches "*means for modulating signals to be transmitted*" and "*means for demodulating received signals*," as recited claim 8. In particular, the Final Office Action states that circuits of high-frequency switch modules in Figs. 3, 4, 25, 26, 34, and 36 of Kemmochi perform modulation/demodulation during a transmitting/receiving process. Applicants respectfully disagree. The circuits of high-frequency switch modules in Figs. 3, 4, 25, 26, 34, and 36 of Kemmochi include transmitting/receiving systems, which operate in 900 MHz and 1800 MHz frequency ranges. However, Kemmochi fails to teach that the transmitting/receiving systems perform modulation/demodulation. That is, while Kemmochi teaches that the transmitting/receiving systems perform transmitting and receiving functions, the transmitting/receiving systems do not perform modulation/demodulation. Because Kemmochi fails to teach that the transmitting/receiving systems perform modulation/demodulation, Applicants respectfully assert that Kemmochi fails to teach "*means for modulating signals to be transmitted*" and "*means for demodulating received signals*," as recited in claim 8.

#### Dependent Claims 9-11

Applicants propose amending claims 9-11 to remove reference numbers. Claims 9-11 depend from and incorporate all of the limitations of the independent claim 8. Thus, Applicants respectfully assert that claims 9-11 are allowable at least based on an allowable claim 8. Additionally, claim 10 may be allowable for further reasons, as described below.

Kemmochi is cited for teaching “a quarter wavelength transmission line” (emphasis added), as recited in claim 10. Applicants respectfully assert that Kemmochi fails to teach the above-identified limitation. With reference to Fig. 26, Kemmochi teaches that a transmission line (LG3) is connected to a switch “Gr” and a transmission line (LD3) is connected to a switch “Dr.” However, Kemmochi fails to teach that any of the transmission lines (LG3) and (LD3) is “a quarter wavelength transmission line” (emphasis added), as recited in claim 10.

#### New Claims 12-18

Applicants propose adding new claims 12-18. Support for claims 12, 13, 16, and 17 is found in Applicants’ specification at, for example, original claims 1 and 8, and page 6, lines 26-30. Support for claim 14 is found in Applicants’ specification at, for example, original claims 1 and 10, and page 6, lines 26-30. Support for claims 15 and 18 is found in Applicants’ specification at, for example, Fig. 2 and original claims 1, 6, and 8.

Claims 12-15 ultimately depend from and incorporate all of the limitations of the independent claim 1. Thus, Applicants respectfully assert that claims 12-15 are allowable at least based on an allowable claim 1. Claims 16-18 ultimately depend from and incorporate all of the limitations of the independent claim 8. Thus, Applicants respectfully assert that claims 16-18 are allowable at least based on an allowable claim 8. Additionally, claims 12-18 may be allowable for further reasons, as described below.

Claims 12 and 16 recite in part that “*the branching circuit is coupled to the terminal through a transmission line, the input impedance of each of the phase shifting circuits being matched to impedance of the transmission line, the output impedance of each of the phase shifting circuits being matched to impedance of a band pass filter, the band pass filter and the phase shifting being in the same branch*” (emphasis added). As described above, Sugar teaches that a quarter-wave element (515) is between a band pass filter ((122) or (120)) and one of the two terminals of the “T/R” switch ((112) or (110)), see Fig. 8. Sugar also teaches that the quarter-wave element (515) creates a phase shift that acts as an impedance transformer, see column 13, lines 2-7. However, Sugar fails to teach the quarter-wave element (515) has input impedance, which is matched to the impedance of the band pass filter ((122) or (120)). Sugar also fails to teach the quarter-

wave element (515) has output impedance, which is matched to the impedance of one of the two terminals of the “T/R” switch ((112) or (110)).

Claims 13 and 17 recite in part that “*the input impedance of each of the phase shifting circuits is 50 Ω*” (emphasis added). Applicants respectfully assert that the cited references fail to teach the above-identified limitations of claims 13 and 17. By setting the input impedance of a phase shifting circuit to 50 Ω, the input impedance of the phase shifting circuit matches the impedance of a transmission line, such as a coaxial cable.

Claim 14 recites in part “*a quarter wavelength transmission line.*” A similar limitation is recited in claim 10, and thus, Applicants respectfully assert that the remarks provided above with regard to claim 10 apply also to claim 14.

Claims 15 and 18 recite in part that “*the branching circuit has a PIN diode, the anode of the PIN diode being coupled to one end of a transmission line, the other end of the transmission line being coupled to the terminal*” (emphasis added). Applicants respectfully assert that Kemmochi fails to teach the above-identified limitation. In particular, Kemmochi teaches away from the above-identified limitation. With reference to Fig. 26, Kemmochi teaches that the cathode of a switch “Gr” is connected to a transmission line (LG3) and the cathode of a switch “Dr” is connected to a transmission line (LD3). Because Kemmochi teaches away from claims 15 and 18, Applicants respectfully assert that claims 15 and 18 are not obvious over Kemmochi.

## CONCLUSION

Applicants respectfully request reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account **50-4019** pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account **50-4019** under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Respectfully submitted,

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